PB-239 641

LAKE WISCONSIN, COLUMBIA AND SAUK COUNTIES, WISCONSIN

Pacific Northwest Environmental Research Laboratory

Prepared for:

National Environmental Research Center
Wisconsin National Guard
Wisconsin Department of Natural Resources

November 1974

DISTRIBUTED BY:

NTIS
National Technical Information Service
U. S. DEPARTMENT OF COMMERCE

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2.	3. PB 239 641
4. TITLE AND SUBTITLE Report on Lake Wisconsin, Columbia and Sauk Counties, Wisconsin		5. REPORT DATE Prepared November 1974 6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) Anonymous (National Eutrophication Survey Staff)		8. PERFORMING ORGANIZATION REPORT NO. Working Paper # 58
9. PERFORMING ORGANIZATION NAME AND ADDRESS Pacific Northwest Environmental Research Laboratory U.S.Environmental Protection Agency 200 S. W. 35th St. Corvallis, Oregon 97330		10. PROGRAM ELEMENT NO. 1BA029 11. CONTRACT/GRANT NO.
12. SPONSORING AGENCY NAME AND ADDRESS U.S. Environmental Protection Agency		13. TYPE OF REPORT AND PERIOD COVERED Final - 1972 14. SPONSORING AGENCY CODE

15. SUPPLEMENTARY NOTES
Prepared in cooperation with the U.S. Environmental Protection Agency, National Environmental Research Center, Las Vegas, Nevada 89114

16. ABSTRACT
Annual total phosphorus and total nitrogen loadings to the lake were estimated and subdivded according to either point or non-point source origin. An assessment of the lake's trophic condition and limiting nutrient is also provided. All data collected by the U.S.E.P.A. National Eutrophication Survey during the one year study of the lake and its tributaries are included in the report.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
eutrophication lakes nutrients phosphorus nitrogen loading		05B 05C

Reproduced by
NATIONAL TECHNICAL
INFORMATION SERVICE
U S Department of Commerce
Springfield VA 22151

PRICES SUBJECT TO CHANGE

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
Release unlimited		47
	20. SECURITY CLASS *(This page)*	22. PRICE
		$3.75

EPA Form 2220-1 (9-73)

Report
on
Lake Wisconsin
Columbia and Sauk Counties
Wisconsin
EPA Region V
Working Paper No. 58

With the cooperation of the
Wisconsin Department of Natural Resources
and the
Wisconsin National Guard
November, 1974

CONTENTS

	Page
Foreword	ii
List of Wisconsin Study Lakes	iv, v
Lake and Drainage Area Map	vi
Sections	
I. Conclusions	1
II. Introduction	3
III. Lake and Drainage Basin Characteristics	4
IV. Lake Water Quality Summary	5
V. Nutrient Loadings	10
VI. Literature Reviewed	16
VII. Appendices	17

FOREWORD

The National Eutrophication Survey was initiated in 1972 in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to fresh water lakes and reservoirs.

OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point-source discharge reduction and non-point source pollution abatement in lake watersheds.

ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

a. A generalized representation or model relating sources, concentrations, and impacts can be constructed.

b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin, and related nutrients.

c. With such a transformation, an assessment of the potential for eutrophication control can be made.

LAKE ANALYSIS

In this report, the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin is documented. The report is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentrations (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's fresh water lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export, and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by EPA and to augment plans implementation by the states.

ACKNOWLEDGMENT

The staff of the National Eutrophication Survey (Office of Research & Development, U. S. Environmental Protection Agency) expresses sincere appreciation to the Wisconsin Department of Natural Resources for professional involvement and to the Wisconsin National Guard for conduct of the tributary sampling phase of the Survey.

Francis H. Schraufnagel, Acting Assistant Director, and Joseph R. Ball of the Bureau of Water Quality, and Donald R. Winter, Lake Rehabilitation Program, provided invaluable lake documentation and counsel during the Survey. Central Office and District Office personnel of the Department of Natural Resources reviewed the preliminary reports and provided critiques most useful in the preparation of this Working Paper series.

Major General James J. Lison, Jr., the Adjutant General of Wisconsin, and Project Officer CW-4 Donald D. Erickson, who directed the volunteer efforts of the Wisconsin National Guardsmen, are also gratefully acknowledged for their assistance to the Survey.

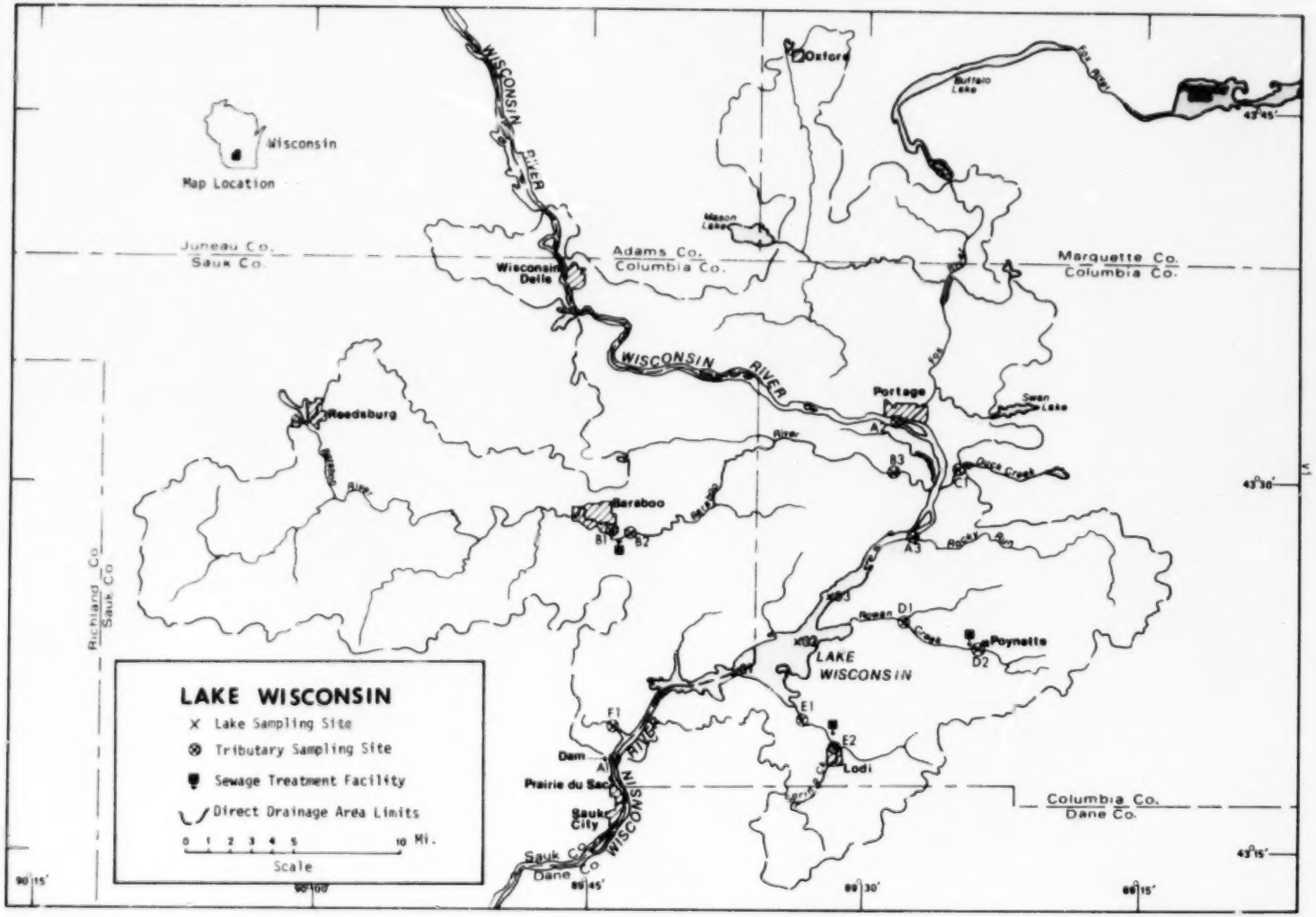
NATIONAL EUTROPHICATION SURVEY

STUDY LAKES

STATE OF WISCONSIN

LAKE NAME	COUNTY
Altoona	Eau Claire
Beaver Dam	Barron
Beaver Dam	Dodge
Big Eau Pleine	Marathon
Browns	Racine
Butte des Morts	Winnebago
Butternut	Price, Ashland
Castle Rock Flowage	Juneau
Como	Walworth
Crystal	Vilas
Delavan	Walworth
Eau Claire	Eau Claire
Geneva	Walworth
Grand	Green Lake
Green	Green Lake
Kegonsa	Dane
Koshkonong	Jefferson, Rock, Dane
Lac La Belle	Waukesha
Middle	Walworth
Nagawicka	Waukesha
Oconomowoc	Waukesha
Okauchee	Waukesha
Petenwell Flowage	Juneau
Pewaukee	Waukesha
Pigeon	Waupaca
Pine	Waukesha
Poygan	Winnebago, Waushara
Rock	Jefferson
Rome Pond	Jefferson, Waukesha
Round	Waupaca
Shawano	Shawano

LAKE NAME	COUNTY
Sinnissippi	Dodge
Swan	Columbia
Tainter	Dunn
Tichigan	Racine
Townline	Oneida
Trout	Vilas
Wapogassett	Polk
Wausau	Marathon
Willow	Oneida
Winnebago	Winnebago, Fond Du Lac, Calumet
Wisconsin	Columbia
Wissota	Chippewa
Yellow	Burnett


Wisconsin
Map Location
WISCONSIN RIVER
Juneau Co.
Sauk Co.
Adams Co.
Columbia Co.
Marquette Co.
Columbia Co.
Oxford
Buffalo Lake
Mason Lake
Wisconsin Dells
Portage
Swan Lake
Roedsburg
Baraboo
Rocky Run
Poynette
LAKE WISCONSIN
Lodi
Prairie du Sac
Sauk City
Dam
Columbia Co.
Dane Co.
Richland Co.
Sauk Co.
Sauk Co.
Dane Co.
LAKE WISCONSIN
X Lake Sampling Site
Tributary Sampling Site
Sewage Treatment Facility
Direct Drainage Area Limits
0 1 2 3 4 5 10 Mi.
Scale
43°45'
43°30'
43°15'
90°15'
90°00'
89°45'
89°30'
89°15'

LAKE WISCONSIN

STORET NO. 5555

I. CONCLUSIONS

A. Trophic Condition:

Survey data show that Lake Wisconsin is eutrophic.

B. Rate-Limiting Nutrient:

The algal assay results were affected by a change in nutrient proportions (see discussion, page 8). The lake data indicate phosphorus limitation in November but nitrogen limitation in June and August.

C. Nutrient Controllability:

1. Point sources--During the sampling year, Lake Wisconsin received a total phosphorus load at a rate about six times that proposed by Vollenweider (in press) as "dangerous"; i.e., a eutrophic rate (see page 15). Of this load, it is calculated that the point sources within the Survey limit* contributed about 4%. If only these sources were considered, it would be concluded that point-source phosphorus control would not appreciably improve the trophic condition of Lake Wisconsin. However, there are numerous point sources in the drainage beyond the 25-mile limit of the Survey†, and a study of broader scope is needed to assess the effectiveness of phosphorus control in the drainage.

---

* See Working Paper No. 1, "Survey Methods".
† McKersie, et al., 1972.

2. Non-point sources (see page 15)--The phosphorus exports of the streams tributary to Lake Wisconsin were quite high (particularly the Baraboo River) and probably are indicative of the unmeasured point sources noted above.

Whether effective control of the phosphorus now reaching Lake Wisconsin can be achieved is problematical in view of the very high drainage area to lake area ratio of about 644 to 1. The mean phosphorus export of the tributaries to the lake (including point sources) would have to be reduced to about 22 lbs/mi^2/yr to achieve a loading rate just equal to Vollenweider's eutrophic rate.

II. INTRODUCTION

Lake Wisconsin is an impoundment of the Wisconsin River near Prairie du Sac which was created in 1914 by the Wisconsin Power and Light Company as a source of hydroelectric power (Martin and Hanson, 1966).

The reservoir has public access and supports a game fish population which includes muskellunge, northern pike, walleyes, largemouth bass, and panfish (Ball, et al., 1971).

Aquatic weeds and phytoplankton have caused some problems in the reservoir in the past; however, the last known chemical treatment for weed control was in 1962, and a small area was chemically treated to control algae in 1970 (Lueschow, 1972).

III. LAKE AND DRAINAGE BASIN CHARACTERISTICS

A. Lake Morphometry†:

1. Surface area: 8,900 acres.
2. Mean depth: 6 feet.
3. Maximum depth: 24 feet.
4. Volume: 53,400 acre/feet.
5. Mean hydraulic retention time: 4 days.

B. Tributary and Outlet:
(See Appendix A for flow data)

1. Tributaries -

Name	Drainage area*	Mean flow*
Wisconsin River (A-2)	8,130.0 mi^2	6,824.2 cfs
Baraboo River	600.0 mi^2	358.0 cfs
Rowan Creek	45.3 mi^2	31.6 cfs
Spring Creek	45.6 mi^2	31.7 cfs
Minor tributaries & immediate drainage -	115.2 mi^2	67.9 cfs
Totals	8,936.1 mi^2	7,313.4 cfs

2. Outlet -

Wisconsin River	8,950.0 mi^2**	7,313.3 cfs

C. Precipitation***:

1. Year of sampling: 42.7 inches.
2. Mean annual: 30.7 inches.

† Ball, 1974.
* Drainage areas are accurate within ±0.5%; mean daily flows are accurate within ±40%; mean monthly flows are accurate within ±35%; and normalized monthly flows are accurate within ±35%.
** Includes area of lake.
*** See Working Paper No. 1.

IV. LAKE WATER QUALITY SUMMARY

Lake Wisconsin was sampled three times during the open-water season of 1972 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from three stations on the lake and generally from two or more depths at each station (see map, page vi). During each visit, a single depth-integrated (15 feet or near bottom to surface) sample was composited from the stations for phytoplankton identification and enumeration; and during the last visit, a single five-gallon depth-integrated sample was composited for algal assays. Also each time, a depth-integrated sample was collected from each of the stations for chlorophyll a analysis. The maximum depths sampled were 21 feet at station 1, 9 feet at station 2, and 4 feet at station 3.

The results obtained are presented in full in Appendix B, and the data for the fall sampling period, when the lake was essentially well-mixed, are summarized below. Note, however, the Secchi disc summary is based on all values.

For differences in the various parameters at the other sampling times, refer to Appendix B.

A. Physical and chemical characteristics:

Parameter	Minimum	Mean	Median	Maximum
		FALL VALUES (11/10/72)		
Temperature (Cent.)	5.8	6.1	5.8	7.0
Dissolved oxygen (mg/l)	9.9	10.5	10.6	10.9
Conductivity (μmhos)	140	148	150	155
pH (units)	7.4	7.5	7.5	7.6
Alkalinity (mg/l)	23	31	33	36
Total P (mg/l)	0.053	0.055	0.055	0.058
Dissolved P (mg/l)	0.027	0.032	0.033	0.037
NO_2 + NO_3 (mg/l)	0.320	0.363	0.375	0.390
Ammonia (mg/l)	0.090	0.097	0.095	0.110
		ALL VALUES		
Secchi disc (inches)	22	32	33	36

B. Biological characteristics:

1. Phytoplankton -

Sampling Date	Dominant Genera	Number per ml
06/24/72	1. Melosira	12,441
	2. Anabaena	1,953
	3. Stephanodiscus	922
	4. Cyclotella	434
	5. Fragilaria	380
	Other genera	904
	Total	17,034
08/20/72	1. Cyclotella	1,628
	2. Melosira	1,374
	3. Anabaena	778
	4. Synedra	561
	5. Gloeocapsa	398
	Other genera	1,048
	Total	5,787
11/10/72	1. Flagellates	1,220
	2. Melosira	587
	3. Cyclotella	346
	4. Synedra	256
	5. Anabaena	181
	Other genera	979
	Total	3,569

2. Chlorophyll a -
(Because of instrumentation problems during the 1972 sampling, the following values may be in error by plus or minus 20 percent.)

Sampling Date	Station Number	Chlorophyll a (µg/l)
06/24/72	01	147.3
	02	143.6
	03	116.3
08/20/72	01	4.0
	02	10.5
	03	22.9
11/10/72	01	6.2
	02	6.6
	03	4.9

C. Limiting Nutrient Study:

1. Autoclaved, filtered, and nutrient spiked -

Spike (mg/l)	Ortho P Conc. (mg/l)	Inorganic N Conc. (mg/l)	Maximum yield (mg/l-dry wt.)
Control	0.048	0.490	12.0
0.006 P	0.054	0.490	11.2
0.012 P	0.060	0.490	11.3
0.024 P	0.072	0.490	11.4
0.060 P	0.108	0.490	14.0
0.060 P + 10.0 N	0.108	10.490	48.3
10.0 N	0.048	10.490	19.6

2. Discussion -

The control yield of the assay alga, Selenastrum capricornutum, indicates the potential primary productivity of the lake was high at the time the sample was collected. Also, the lack of yield response to increased levels of orthophosphorus, until nitrogen was also added, indicates the sample was

nitrogen limited. However, while there was a 3% increase in inorganic nitrogen in the sample upon autoclaving, there was a 17% increase in orthophosphorus which resulted in a shift from the lake N/P ratio of 14/1 (phosphorus limited) to the sample N/P ratio of 10/1 (nitrogen limited).

The lake data, then, indicate phosphorus limitation in November but nitrogen limitation in June (N/P = 3/1) and in August (N/P = 9/1).

D. Trophic Condition:

Survey data show that Lake Wisconsin is eutrophic. Of the 46 Wisconsin lakes studied, 25 had less mean total phosphorus, 24 had less mean dissolved phosphorus, and 26 had less mean inorganic nitrogen. Only four of the study lakes had higher mean chlorophyll _a_, and 32 had greater mean Secchi disc transparency.

V. NUTRIENT LOADINGS
(See Appendix C for data)

For the determination of nutrient loadings, the Wisconsin National Guard collected a monthly near-surface grab sample from each of the tributary sites indicated on the map (page vi), except for the high runoff months of April and May when two samples were collected. Sampling was begun in September, 1972, and was completed in August, 1973.

Through an interagency agreement, stream flow estimates for the year of sampling and a "normalized" or average year were provided by the Madison District Office of the U.S. Geological Survey for the tributary sites nearest the lake.

In this report, nutrient loads for sampled tributaries were calculated using mean annual concentrations and mean annual flows. Nutrient loadings for "minor tributaries and immediate drainage" ("ZZ" of U.S.G.S.) were estimated by using the means of the nutrient loads, in lbs/mi^2/year, in Rowan and Spring creeks at stations D-1 and E-1 and multiplying the means by the ZZ area in mi^2.

The operator of the Baraboo wastewater treatment plant provided monthly effluent samples and corresponding flow data. However, the cities of Lodi and Wisconsin Dells, the villages of Lake Delton and Poynette, and the Badger Army Ammunition Works (sewage) did not participate in the Survey, and nutrient loads were estimated at 2.5 lbs P and 7.5 lbs N/capita/year (the City of Portage discharges to the Fox River).

The process wastes of the Badger A.A.W. were not sampled directly; however, samples were collected from the ditch receiving the process wastes at station F-1. The mean total nitrogen concentration of these samples and the process flow reported by McKersie, et al. (1972), were used to calculate the nitrogen contribution of this source. The value shown in the nitrogen loading table is that calculated minus the estimated sewage nitrogen load. The phosphorus load in the process wastes is assumed to be negligible.

In the following loading tables, the loads given for the tributaries are those measured minus the point-source loads, if any.

A. Waste Sources:

1. Known municipal -

Name	Pop. Served*	Treatment	Mean Flow (mgd)	Receiving Water
Baraboo	7,931	Trickling filter	1.820	Baraboo River
Lake Delton	1,059	Prim. clarifier	0.300**	Wisconsin River
Lodi	1,831	Trickling filter	0.285†	Spring Creek
Poynette	1,118	Trickling filter	0.080†	Rowan Creek
Wisconsin Dells	2,401	Prim. clarifier	0.500**	Wisconsin River
Badger Army Ammo. Wks (sanitary wastes)	2,000	Trickling filter	0.200†	Wisconsin River

* 1970 Census; Badger Army Ammo. Wks. "pop. served" estimated from flow (100 gal/capita/day).
** Schraufnagel, 1974.
† McKersie, et al., 1972.

2. Known industrial* -

Name	Product	Treatment	Mean Flow (mgd)	Receiving Water
Badger Army Ammo. Wks. (process wastes)	Ammunition	Neutralization + lagoon	25.000	Wisconsin River

* McKersie, et al., 1972.

B. Annual Total Phosphorus Loading - Average Year:

1. Inputs -

Source	lbs P/ yr	% of total
a. Tributaries (non-point load) -		
Wisconsin River (A-2)	1,005,640	83.3
Baraboo River	133,850	11.1
Rowan Creek	5,740	0.5
Spring Creek	5,400	0.4
b. Minor tributaries & immediate drainage (non-point load) -	10,140	0.8
c. Known municipal -		
Baraboo	24,440	2.0
Lake Delton	2,650	0.2
Lodi	4,580	0.4
Poynette	2,800	0.2
Wisconsin Dells	6,000	0.5
Badger AAW	5,000	0.4
d. Septic tanks* -	420	<0.1
e. Industrial -		
Badger AAW	nil	-
f. Direct precipitation** -	1,390	0.1
Total	1,207,780	100.0

2. Outputs -

Lake outlet - Wisconsin River 1,146,010

3. Net annual P accumulation - 61,770 pounds.

* Based on 672 lakeshore dwellings (1959 U.S.G.S. quad. maps); see Working Paper No. 1.
** See Working Paper No. 1.

C. Annual Total Nitrogen Loading - Average Year:

1. Inputs -

Source	lbs N/ yr	% of total
a. Tributaries (non-point load) -		
Wisconsin River	17,640,160	81.2
Baraboo River	1,424,330	6.6
Rowan Creek	128,730	0.6
Spring Creek	156,640	0.7
b. Minor tributaries & immediate drainage (non-point load) -	379,350	1.7
c. Known municipal -		
Baraboo	90,920	0.4
Lake Delton	7,940	<0.1
Lodi	13,730	0.1
Poynette	8,380	<0.1
Wisconsin Dells	18,010	0.1
Badger AWW	15,000	0.1
d. Septic tanks* -	15,790	0.1
e. Known industrial -		
Badger AAW	1,743,790	8.0
f. Direct precipitation** -	85,740	0.4
Total	21,728,510	100.0

2. Outputs -

Lake outlet - Wisconsin River 21,279,010

3. Net annual N accumulation - 449,500 pounds

* Based on 672 lakeshore dwellings (1959 U.S.G.S. quad. maps); see Working Paper No. 1.
** See Working Paper No. 1.

D. Mean Annual Non-point Nutrient Export by Subdrainage Area:

Tributary	lbs P/mi^2/yr	lbs N/mi^2/yr
Wisconsin River (A-2)	124	2,170
Baraboo River	223	2,374
Rowan Creek	121	2,842
Spring Creek	118	3,435

E. Yearly Loading Rates:

In the following table, the existing phosphorus loading rates are compared to those proposed by Vollenweider (in press). Essentially, his "dangerous" rate is the rate at which the receiving waters would become eutrophic or remain eutrophic; his "permissible" rate is that which would result in the receiving water remaining oligotrophic or becoming oligotrophic if morphometry permitted. A mesotrophic rate would be considered one between "dangerous" and "permissible".

	Total Phosphorus		Total Nitrogen	
Units	Total	Accumulated	Total	Accumulated
lbs/acre/yr	135.7	6.9	2,441.4	50.5
grams/m^2/yr	15.21	0.78	273.6	5.7

Vollenweider loading rates for phosphorus (g/m^2/yr) based on mean depth and mean hydraulic retention time of Lake Wisconsin:

"Dangerous" (eutrophic rate)	2.50
"Permissible" (oligotrophic rate)	1.25

VI. LITERATURE REVIEWED

Anonymous, 1972. Wisconsin lakes. Publ. 218-72. Dept. of Natural Resources, Madison.

Ball, Joseph R., 1974. Personal communication (lake morphometry). Dept. of Natural Resources, Madison.

_____, Tom Smith, and C. W. Threinen, 1971. Surface water resources of Sauk County. Dept. of Natural Resources, Madison.

Lueschow, Lloyd A., 1972. Biology and control of selected aquatic nuisances in recreational waters. Tech. Bull. No. 57. Dept. of Natural Resources, Madison.

Martin, R. O. R., and Ronald L. Hanson, 1966. Reservoirs in the United States. U.S. Geological Survey Water Supply Paper 1838. Washington, D.C.

McKersie, Jerome R., Robert M. Krill, Floyd F. Stautz, Charles Kozel, and Richard P. Narf; 1972. Lower Wisconsin River pollution investigation survey. Dept. of Natural Resources, Madison.

Schraufnagel, Francis H., 1974. Personal communication (Lake Delton and Wisconsin Dells waste treatment facilities). Dept. of Natural Resources, Madison.

Schraufnagel, F. H., L. A. Montie, Jerome R. McKersie, Gary W. Karl, and Charles Kozel; 1966. Report on an investigation of the pollution in the Lower Wisconsin River drainage basin made during 1965. Dept. of Natural Resources, Madison.

Vollenweider, Richard A., (in press). Input-output models. Schweiz. A. Hydrol.

VII. APPENDICES

APPENDIX A

TRIBUTARY FLOW DATA

TRIBUTARY FLOW INFORMATION FOR WISCONSIN 9/30/74

LAKE CODE 5555 LAKE WISCONSIN

TOTAL DRAINAGE AREA OF LAKE 8950.00

TRIBUTARY	SUB-DRAINAGE AREA	NORMALIZED FLOWS JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
5555A1	8950.00	4685.9	4978.8	8981.3	14643.0	10738.0	9878.9	6247.9	4685.9	6247.9	5857.4	6345.5	5271.7	7313.3
5555A3	8730.00	4700.0	5000.0	8900.0	14000.0	10000.0	9100.0	6200.0	4700.0	6200.0	5800.0	6400.0	5200.0	7182.2
5555E1	45.60	20.00	20.00	46.00	46.00	34.00	74.00	21.00	20.00	28.00	26.00	26.00	20.00	31.72
5555ZZ	174.00	66.00	66.00	200.00	200.00	130.00	73.00	65.00	58.00	89.00	90.00	90.00	66.00	99.54

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 8950.00
SUM OF SUB-DRAINAGE AREAS = 8949.60

TOTAL FLOW IN = 87774.00
TOTAL FLOW OUT = 87762.12

MEAN MONTHLY FLOWS AND DAILY FLOWS

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
5555A1	9	72	11000.00	23	10000.00				
	10	72	17000.00	15	11000.00				
	11	72	13000.00						
	12	72	8800.00	9	8400.00				
	1	73	11400.00						
	2	73	8800.00	10	9500.00				
	3	73	27500.00	11	24500.00				
	4	73	25000.00	14	15500.00	29	17000.00		
	5	73	28000.00	12	34000.00	25	15500.00		
	6	73	14300.00	11	12300.00				
	7	73	5800.00	15	5600.00				
	8	73	5500.00	19	5000.00				
5555A3	9	72	10000.00	24	8600.00				
	10	72	16000.00	14	11000.00				
	11	72	13000.00						
	12	72	8600.00	10	8200.00				
	1	73	11200.00						
	2	73	8500.00	10	9100.00				
	3	73	27000.00	11	39000.00				
	4	73	24500.00	20	52000.00				
	5	73	27500.00	3	37000.00	25	15400.00		
	6	73	14000.00	23	9800.00				
	7	73	5700.00	18	6200.00				
	8	73	5400.00	19	4800.00				

31

TRIBUTARY FLOW INFORMATION FOR WISCONSIN 9/30/74

LAKE CODE 5555 LAKE WISCONSIN

MEAN MONTHLY FLOWS AND DAILY FLOWS

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
5555E1	9	72	50.00	23	28.00				
	10	72	70.00	15	33.00				
	11	72	42.00						
	12	72	25.00	10	21.00				
	1	73	44.00						
	2	73	36.00	10	30.00				
	3	73	86.00	11	160.00				
	4	73	88.00	14	66.00	29	78.00		
	5	73	120.00	12	72.00	25	98.00		
	6	73	48.00	11	46.00				
	7	73	32.00	15	32.00				
	8	73	35.00	19	30.00				
5555Z2	9	72	210.00	23	150.00				
	10	72	250.00	15	110.00				
	11	72	150.00						
	12	72	87.00	9	74.00				
	1	73	190.00						
	2	73	140.00	10	110.00				
	3	73	370.00	11	700.00				
	4	73	380.00	14	280.00	29	330.00		
	5	73	420.00	12	270.00	25	370.00		
	6	73	150.00	11	140.00				
	7	73	94.00	15	94.00				
	8	73	100.00	19	88.00				

APPENDIX B

PHYSICAL and CHEMICAL DATA

STORET RETRIEVAL DATE 74/09/30

555501
43 22 06.0 089 37 18.0
WISCONSIN LAKE
55 WISCONSIN

11EPALES
3

2111202
0011 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/24	09 20	0000	20.0	9.7	32	142	8.11	50	0.050	0.030	0.062	0.039
	09 20	0010	20.0	9.1		142	8.00	52	0.050	0.060	0.120	0.037
72/08/20	11 35	0000			30	180	8.80	55	0.080	0.050	0.051	0.031
	11 35	0004	27.2	8.4		180	8.05	55	0.120	0.080	0.050	0.028
	11 35	0015	24.8	4.4		188	7.25	57	0.260	0.270	0.066	0.036
	11 35	0021	23.6	2.0		190	7.00	60	0.170	0.610	0.146	0.077
72/11/10	11 10	0000			36	150	7.60	33	0.390	0.100	0.056	0.036
	11 10	0004	5.8	10.7		150	7.60	34	0.380	0.090	0.058	0.034
	11 10	0014	5.8	10.6		150	7.60	32	0.390	0.090	0.055	0.032

12

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/06/24	09 20	0000	147.3J
72/08/20	11 35	0000	4.0J
72/11/10	11 10	0000	6.2J

J VALUE KNOWN TO BE IN ERROR

STORET RETRIEVAL DATE 74/09/30

555502
43 23 18.0 089 33 36.0
WISCONSIN LAKE
55 WISCONSIN

11EPALES 2111202
3 0007 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/24	09 40	0000	19.5	9.1	22	130	7.38	45	0.080	0.060	0.150	0.041
72/08/20	12 00	0000			33	170	7.50	49	0.300	0.080	0.058	0.041
	12 00	0004	26.3	7.0		168	7.50	49	0.280	0.090	0.058	0.038
	12 00	0009	26.1	7.5		170	7.50	48	0.300	0.080	0.061	0.040
72/11/10	10 50	0000			36	140	7.40	23	0.320	0.090	0.053	0.028
	10 50	0006	5.8	9.9		140	7.50	29	0.330	0.110	0.053	0.027

22

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/06/24	09 40	0000	143.6J
72/08/20	12 00	0000	10.5J
72/11/10	10 50	0000	6.6J

J VALUE KNOWN TO BE IN ERROR

STORET TRIEVAL DATE 74/09/30

555503
43 25 12.0 089 31 48.0
WISCONSIN LAKE
55 WISCONSIN

11EPALES 2111202
3 0007 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/24	09 50	0000	19.8	10.4	33	115	7.78	40	0.040	0.030	0.096	0.031
72/08/20	15 20	0000			28	173	7.60	50	0.240	0.070	0.079	0.051
	15 20	0004	26.3	11.2		162	7.80	52	0.240	0.060	0.081	0.037
72/11/10	10 35	0000	7.0	10.9	36	155	7.50	36	0.370	0.100	0.058	0.037

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/06/24	09 50	0000	116.3J
72/08/20	15 20	0000	22.9J
72/11/10	10 35	0000	4.9J

J VALUE KNOWN TO BE IN ERROR

APPENDIX C

TRIBUTARY and WASTEWATER TREATMENT PLANT DATA

STORET RETRIEVAL DATE 74/10/02

5555A1 LS5555A1
43 18 30.0 089 43 30.0
WISCONSIN
55039 15 BARABOO
O/LAKE WISCONSIN
DAM 1 MI N OF PRAIRIE DU SAC
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/23	16	15	0.650	1.000	0.142	0.042	0.111
72/10/15	13	30	0.680	0.950	0.115	0.032	0.084
72/11/11	15	25	0.510	1.150	0.058	0.029	0.070
73/01/06	15	25	0.560	0.840	0.099	0.034	0.070
73/02/10	15	20	0.620	1.050	0.180	0.050	
73/03/11	13	40	0.720	1.220	0.210	0.039	0.130
73/04/14	13	40	0.440	0.800	0.066	0.013	0.060
73/04/29	10	15	0.320	0.820	0.018	0.017	0.065
73/05/12	09	25	0.730	1.050	0.040	0.027	0.075
73/05/25	11	10	0.190	0.960	0.050	0.017	0.065
73/06/11	12	10	0.260	1.320	0.078	0.018	0.070
73/07/15	09	15	0.350	1.030	0.120	0.022	0.075
73/08/19	13	00	0.357	0.640	0.108	0.035	0.080

STORET RETRIEVAL DATE 74/10/02

5555A2 LS5555A2
43 32 30.0 089 28 30.0
WISCONSIN RIVER
55 15 PORTAGE
T/LAKE WISCONSIN
ST HWY 33 BRDG S EDGE PORTAGE ABOVE STP
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/24	08 45		0.646	1.150	0.120	0.038	0.105
72/10/14	08 30		0.330	0.900	0.080	0.028	0.034
72/11/11	08 15		0.280	1.200	0.052	0.027	0.066
72/12/10	08 40		0.336	0.920	0.073	0.026	0.046
73/01/14	08 45		0.370	0.980	0.071	0.018	0.055
73/02/11	10 45		0.420	1.100	0.088	0.026	0.055
73/04/07	09 00		0.340	1.670	0.154	0.019	0.060
73/04/20	10 00		0.280	0.720	0.072	0.016	0.055
73/05/03	17 15		0.200	0.750	0.032	0.023	0.065
73/05/25	10 40		0.147	0.870	0.016	0.018	0.065
73/06/24			0.280	0.960	0.320	0.038	0.090
73/07/18			0.126	1.150	0.029	0.019	0.095
73/08/19			0.138	0.830	0.020	0.024	0.100

STORET RETRIEVAL DATE 74/10/02

555543 LS555543
43 28 00.0 089 28 00.0
WISCONSIN RIVER
55 15 POYNETTE
T/LAKE WISCONSIN
FROM HAGENS HGTS RESORT DOCK IN DEKORA
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/24	10 45		0.195	0.900	0.184	0.022	0.100
72/10/14	09 50		0.400	0.850	0.120	0.025	0.083
72/11/11	09 45		0.315	0.970	0.032	0.024	0.060
73/03/14	07 45		0.440	1.400	0.147	0.027	0.120
73/04/20	10 55		0.290	1.600	0.147	0.016	0.050
73/05/03	19 00		0.200	0.840	0.035	0.024	0.080
73/05/25	11 45		0.140	0.900	0.020	0.022	0.067
73/06/23			0.273	0.820	0.060	0.044	0.085
73/07/18			0.126	0.960	0.016	0.018	0.080
73/08/19			0.130	0.940	0.029	0.025	0.095

STORET RETRIEVAL DATE 74/10/02

555581 LS5555A1
43 27 30.0 089 44 00.0
BARABOO RIVER
55 15 BARABOO
T/LAKE WISCONSIN
CITY BRDG SE CORNER OF BARABOO ABOV STP
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/23	14 00		0.309	1.250	0.250	0.070	0.270
72/10/15	11 45		0.830	0.450	0.085	0.080	0.170
72/11/11	17 20		0.830	0.460	0.039	0.077	0.147
73/01/14	17 35		1.320	1.390	0.340	0.105	0.195
73/02/10	15 15		1.120	1.680	0.280	0.096	0.200
73/03/11	14 33		0.920	2.100	0.340	0.079	0.170
73/04/14	15 00		0.760	2.100	0.080	0.064	0.210
73/04/29	11 25		0.750	0.880	0.056	0.060	0.190
73/05/12	11 25		0.550	0.930	0.034	0.076	0.220
73/05/25	12 35		0.540	0.960	0.033	0.078	0.140
73/06/11	15 55		0.820	1.400	0.096	0.090	0.190
73/07/15	11 50		0.620	1.300	0.038	0.120	0.375
73/08/19	14 40		0.600	0.660	0.038	0.115	0.270

STORET RETRIEVAL DATE 74/10/02

555582 L5555582
43 27 30.0 089 43 00.0
HARABOO RIVER
55 15 HARABOO
7/LAKE WISCONSIN
ST HWY 113 BRDG ESE OF HARABOO BELO STP
11FRALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/23	14	15	0.245	1.550	0.290	0.053	0.310
72/10/15	11	50	0.897	0.600	0.112	0.100	0.190
72/11/11	17	10	0.890	0.690	0.088	0.126	0.200
72/12/09	16	15	1.120	0.720	0.120	0.105	0.220
73/01/14			1.400	1.890	0.440	0.138	0.250
73/02/10	17	12	1.180	1.320	0.340	0.147	0.300
73/03/11	14	20	0.910	2.100	0.370	0.083	0.125
73/04/14	14	50	0.750	0.870	0.056	0.084	0.250
73/04/29	11	20	0.750	0.980	0.080	0.069	0.225
73/05/12	11	20	0.580	0.960	0.046	0.090	0.230
73/05/25	12	50	0.580	0.930	0.042	0.087	0.200
73/06/11	13	50	0.890	1.260	0.120	0.120	0.240
73/07/15	11	45	0.680	1.760	0.450	0.198	0.375
73/08/19	14	30	0.680	0.760	0.082	0.160	0.330

STORET RETRIEVAL DATE 74/10/02

555583 L5555583
43 30 00.0 089 28 30.0
BARABOO RIVER
55 15 PORTAGE
T/LAKE WISCONSIN
CO HWY U BRDG S OF PORTAGE
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/24	09 10		0.308	1.700	0.250	0.093	0.310
72/10/14	09 45		1.000	0.600	0.110	0.096	0.190
72/11/11	08 30		0.960	0.850	0.050	0.088	0.170
72/12/10	09 00		1.160	1.470	0.096	0.066	0.250
73/01/14	09 00		1.320	0.840	0.200	0.069	0.140
73/02/11	10 30		1.200	1.600	0.320	0.092	0.165
73/03/14	07 30		0.980	1.500	0.315	0.082	0.300
73/04/07	09 10		0.950	0.960	0.039	0.071	0.195
73/04/20	10 15		0.870	2.050	0.154	0.054	0.210
73/05/12	17 30		0.580	1.050	0.075	0.100	0.240
73/05/17	10 50		0.620	1.020	0.030	0.083	0.220
73/06/24			1.020	2.400	0.092	0.096	0.230
73/07/18			0.810	0.750	0.035	0.130	0.260
73/09/19			0.970	0.560	0.025	0.130	0.264

STORET RETRIEVAL DATE 74/10/02

5555C1 L55555C1
43 30 30.0 089 25 00.0
DUCK CREEK
55 15 PORTAGE
T/LAKE WISCONSIN
US 116 BRDG SE OF PORTAGE
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/24	11 20		0.238	1.850	0.400	0.023	0.115
72/10/14	10 15		0.970	1.100	0.138	0.052	0.095
72/11/11	10 15		0.960	0.770	0.012	0.026	0.046
72/12/10			2.400	1.100	0.088	0.032	0.069
73/01/14	10 30		2.700	2.100	0.180	0.037	0.095
73/02/11	09 20		1.860	1.050	0.132	0.050	0.090
73/03/14	05 45		1.300	1.700	0.480	0.075	
73/04/07	11 00		0.680	1.320	0.028	0.019	0.055
73/04/20	11 30		0.220	1.100	0.034	0.012	0.050
73/05/03			0.180	0.720	0.017	0.020	0.060
73/05/17	12 00		0.230	1.050	0.019	0.030	0.065
73/06/24			0.500	1.260	0.399	0.105	0.185
73/07/18			0.620	0.960	0.048	0.056	0.115
73/08/19	08 45		0.830	0.750	0.042	0.063	0.105

STORET RETRIEVAL DATE 74/10/02

555501 LS555501
43 24 30.0 089 28 00.0
ROWAN CREEK
55 15 POYNETTE
T/LAKE WISCONSIN
CO HWY J BRDG WNW OF POYNETTE BELO STP
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/24	10 05		0.120	0.550	0.345	0.023	0.140
72/10/14	09 25		0.975	0.300	0.067	0.073	0.120
72/11/11	09 20		1.600	0.330	0.042	0.070	0.097
72/12/10	11 00		2.100	0.460	0.130	0.080	0.120
73/01/14	10 00		2.060	0.140	0.133	0.083	0.125
73/02/11	10 00		2.100	0.350	0.132	0.088	0.125
73/03/14	07 00		1.220	0.780	0.138	0.079	0.198
73/04/07	09 30		1.300	0.960	0.058	0.052	0.080
73/04/20	10 45		1.240	2.900	0.130	0.054	0.090
73/05/03	18 00		0.640	1.100	0.080	0.105	0.260
73/05/17	11 15		1.400	0.580	0.040	0.058	0.095
73/06/24			1.600	2.300	0.126	0.082	0.150
73/07/18			1.620	0.480	0.070	0.105	0.175
73/08/19			1.420	0.230	0.033	0.068	0.095

STORET RETRIEVAL DATE 74/10/02

555502 LS555502
43 23 30.0 089 24 07.0
ROWAN CREEK
55 15 POYNETTE
T/LAKE WISCONSIN
CO HWY S BRDG IN POYNETTE ABOV STP
11FPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/24	09 45		0.367	0.200		0.031	0.043
72/10/14	09 10		1.600	0.200	0.035	0.021	
72/11/11	09 00		2.200	0.290	0.018	0.025	0.033
72/12/10	10 30		2.400	0.100K	0.021	0.015	0.022
73/01/14	10 20		2.400	0.100K	0.020	0.023	0.025
73/02/11			2.400	0.100K	0.031	0.028	0.040
73/03/14	06 30		1.500		0.069	0.062	
73/04/07	10 20		2.100	0.130	0.009	0.015	0.025
73/04/20	11 05		2.000	0.660	0.027	0.024	0.055
73/05/03	17 20		2.100	0.690	0.089	0.075	0.145
73/05/17	11 30		2.200	0.230	0.009	0.015	0.025
73/06/24			2.040	0.870	0.050	0.027	0.045
73/07/18			1.820	0.145	0.018	0.018	0.035
73/08/14			1.920	0.100K	0.014	0.035	0.035

K VALUE KNOWN TO BE LESS THAN INDICATED

STORET RETRIEVAL DATE 74/10/02

SSSSEI LSSSSSEI
43 20 30.0 089 33 30.0
SPRING CREEK
SS 15 BARABOO
T/LAKE WISCONSIN
ST HWY 113 BRDG NW OF LODI MELO STP
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/23	15	25	0.342	0.950	0.555	0.115	0.153
72/10/15	12	55	1.580	0.505	0.080	0.073	0.105
72/11/11	16	00	1.820	0.480	0.160	0.132	0.160
72/12/09	15	00	1.960	0.500	0.140	0.084	0.138
73/01/06	14	40	2.040	0.760	0.150	0.093	0.165
73/02/10	14	15	2.000	0.560	0.123	0.095	
73/03/11	13	05	1.420	3.400	0.292	0.153	0.360
73/04/14	14	15	1.680	1.800	0.091	0.091	0.240
73/04/29	10	50	1.640	0.500	0.092	0.088	0.135
73/05/12	10	00	1.760	0.400	0.054	0.071	0.110
73/05/25	11	45	1.180	1.200	0.075	0.088	0.155
73/06/11	13	15	1.720	0.770	0.068	0.078	0.115
73/07/15	10	15	1.760	4.100	0.072	0.086	0.125
73/08/19	13	35	1.740	0.220	0.048	0.078	0.120

STORET RETRIEVAL DATE 74/10/02

5555E2 L5555E2
43 19 00.0 089 31 30.0
SPRING CREEK
55 15 MARAHOO
T/LAKE WISCONSIN
ST HWY 60 BRDG IN LODI ABOVSTP
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/23	15 35		0.310	0.510			
72/10/15	12 05		1.640	0.360	0.098	0.028	0.050
72/11/11	15 50		1.660	0.440	0.034	0.031	0.060
72/12/09	14 55		2.040	0.740	0.050	0.025	0.063
73/01/06	14 00		2.000	0.400	0.050	0.026	0.055
73/02/10	14 01		2.000	0.420	0.046	0.034	
73/03/11	12 40		1.240	3.900	0.520	0.282	0.700
73/04/14	14 05		1.080	1.150	0.039	0.066	0.180
73/04/29	10 40		1.660	0.390	0.046	0.037	0.040
73/05/12	09 50		1.800	0.360	0.048	0.033	0.055
73/05/25	11 35		1.060	1.000	0.089	0.052	0.110
73/06/11	13 05		1.740	2.300	0.073	0.042	0.075
73/07/15	09 40		1.680	0.420	0.049	0.039	0.075
73/08/19	13 25		1.600	0.280	0.060	0.037	0.060

STORET RETRIEVAL DATE 74/10/02

```
 S555F1          LS5555F1
43 20 00.0 089 31 30.0
UNNAMED CREEK
55       15 BARABOO
T/LAKE WISCONSIN
ST HWY 78 BRDG BELO BADGER
11EPALES                 2111204
4                        0000 FEET  DEPTH
```

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/23	15	30	0.627	1.850	0.163	0.038	0.078
72/10/15	13	40	69.000		0.395	0.022	0.060
72/11/11	15	15	9.300		0.310	0.005K	0.037
72/12/09	14	25	64.000		0.302	0.007	0.054
73/01/06	15	25	58.500	0.550	0.330	0.018	0.045
73/02/10	15	35	64.000		0.290	0.013	
73/03/11	13	50	42.000		0.370	0.020	0.040
73/04/14	13	30	55.000		0.230	0.005K	0.067
73/04/29	10	05	54.000		0.336	0.005K	0.040
73/05/12	09	15	1.800		0.310	0.012	0.055
73/05/25	11	00	54.000		0.380	0.008	0.060
73/06/11	12	05	41.200	1.260	0.610	0.012	0.035
73/07/15	09	05	3.200	1.800	0.260	0.007	0.080
73/08/19	12	50	4.400	2.100	0.550	0.018	0.095

K VALUE KNOWN TO BE LESS THAN INDICATED

STORET RETRIEVAL DATE 73/09/30

555550 TF555550 P007931
43 27 30.0 089 43 30.0
CITY OF BARABOO
55 15 BARABOO
T/LAKE WISCONSIN
BARABOO RIVER
11EPALES 2141204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00631 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/01/03	08	00							
CP(T)- 73/01/03	15	00	6.500	11.000	0.060	4.160	5.100	1.250	1.560
73/02/04	08	00							
CP(T)- 73/02/04	15	00	6.000	11.500	1.160	3.700	4.700	1.500	1.800
73/03/01	08	00							
CP(T)- 73/03/01	15	00	4.000	9.100	1.130	3.600	4.400	1.700	1.600
73/04/04	08	00							
CP(T)- 73/04/04	15	00	3.700	10.000	0.330	2.600	3.425	2.200	2.300
73/05/03	08	00							
CP(T)- 73/05/03	15	00	4.450	9.400	0.082	2.050	2.800	2.800	2.400
73/06/01	08	00							
CP(T)- 73/06/01	15	00	1.030	8.000	0.021	3.120	4.000	2.700	2.700
73/07/05	08	00							
CP(T)- 73/07/05	15	00	11.000	5.300	0.094	3.430	4.500	1.100	2.400
73/08/15	08	00							
CP(T)- 73/08/15	15	00	5.700	5.800	0.200	2.000	4.600	1.400	1.400
73/09/05	08	00							
CP(T)- 73/09/05	15	00	7.400	7.965		4.340		1.500	1.600
73/10/03	08	00							
CP(T)- 73/10/03	15	00	11.230	15.500	4.600	4.900	6.500	1.900	1.400
73/11/05	08	00							
CP(T)- 73/11/05	15	00	10.200	7.500	0.130	3.900	4.600	1.400	1.800
73/12/05	08	00							
CP(T)- 73/12/05	15	00	9.600	9.900	0.093	3.700	4.600	1.500	1.400

STORET RETRIEVAL DATE 74/04/30

555550 TF555550 P007931
43 27 30.0 089 43 30.0
CITY OF WAUSAU
55 15 WAUSAU
T/LAKE WISCONSIN
WAUSAU RIVER
11EPALES 2141204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO3+NO2-N TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
74/01/04 08 00 CP(T)- 74/01/04 15 00			4.900	17.000	3.520	3.600	5.000	1.100	1.300

Reproduced from best available copy.

38